CLAIMS

1. A complex black oxide particle characterized in that the particle comprises oxides of cobalt, copper, and manganese, and the molar ratio of copper to cobalt is 0.1 to 0.5, and the molar ratio of manganese to cobalt is 0.2 to 1.0.

2. The complex black oxide particle according to claim 1, wherein the particle is a spinel type or an inversed-spinel type.

3. The complex black oxide particle according to claim 1, wherein the primary particle diameter of the particle is 0.05 to 0.15 μm, and the coefficient of variation, CV value, which is given by the following equation (1) for a particle size distribution obtained by SEM observation,

CV value (%) = (standard deviation of particle diameter (μm) obtained from SEM image) / (number-averaged particle diameter (μm) obtained from SEM image) × 100 (1),

is equal to or smaller than 40%.

4. The complex black oxide particle according to claim 1, wherein the particle has a BET specific surface area of 10 to 40 m^2/g.

5. The complex black oxide particle according to claim 1, wherein the particle has an oil absorption amount of equal to or lower than 40 ml/100 g.

6. The complex black oxide particle according to claim 1, wherein the particle further contains silicon, and the silicon content is 0.1 to 3% by mass based on the whole oxide particle.

7. The complex black oxide particle according to claim 6, wherein the particle has a reflectance at 20 degrees of equal to or higher than 40% as measured with a color difference meter.

8. The complex black oxide particle according to claim 1, wherein the particle has a layer of Al oxide on the surface of the particle.

9. The complex black oxide particle according to claim 8, wherein the Al content in the layer on the surface of the particle is 0.05 to 3% by mass based on the whole particle.

10. The complex black oxide particle according to claim 8, wherein the layer on the surface of the particle contains a P or Si compound.

11. The complex black oxide particle according to claim 10, wherein the total content of Al and P in the layer on the surface of the particle is 0.1 to 6% by mass based on the whole particle.

12. The complex black oxide particle according to claim 10, wherein the total content of Al and Si in the layer on the surface of the particle is 0.1 to 6% by mass based on the whole particle.

13. The complex black oxide particle according to claim 8, wherein the particle has an electrical resistance of equal to or higher than 1×10^4 Ωcm.

14. A black coating material comprising the complex black oxide particle according to claim 1.

15. A black matrix prepared from the black coating material according to claim 14

16. A process for producing the complex black oxide particle recited in claim 1, wherein an aqueous solution of mixed metal salt prepared from water-soluble salts of cobalt, copper, and manganese is mixed and neutralized with alkali hydroxide to obtain a slurry of metal hydroxide;

the resultant slurry of metal hydroxide is kept at a pH of 10 to 13 and oxidized at a temperature of higher than 40ºC and equal to or lower than 60ºC to obtain a precursor slurry;

the resultant precursor slurry is aged at 80 to 150ºC; and

after solid-liquid separation of the slurry, a solid content is subjected to heat treatment at 400 to 700ºC for longer than 1 hour and equal to or shorter than 3 hours.

17. A process for producing the complex black oxide particle recited in claim 6, wherein an aqueous solution of mixed metal salt prepared from water-soluble salts of cobalt, copper, and manganese is mixed and neutralized with alkali hydroxide to obtain a slurry of metal hydroxide;

the resultant slurry of metal hydroxide is oxidized while the pH of the slurry is kept at 10 to 13 to obtain a precursor slurry;

an aqueous solution of water-soluble silicate is added to the resultant precursor slurry, and the slurry is kept at a pH of 6 to 10; and

after solid-liquid separation of the slurry, a solid content is subjected to heat treatment at 400 to 700ºC .

18. A process for producing the complex black oxide particle recited in claim 6, wherein an aqueous solution of mixed metal salt prepared from water-soluble salts of cobalt, copper, and manganese and an aqueous solution of water-soluble silicate is mixed and neutralized with alkali hydroxide to obtain a slurry of metal hydroxide;

the resultant slurry of metal hydroxide is oxidized while the pH of the slurry is kept at 10 to 13 to obtain a precursor slurry; and

after solid-liquid separation of the resultant precursor slurry, a solid content is subjected to heat treatment at 400 to 700ºC .

19. A process for producing the complex black oxide particle recited in claim 8, wherein an aqueous solution of mixed metal salt prepared from water-soluble salts of cobalt, copper, and manganese is mixed and neutralized with alkali hydroxide to obtain a slurry of metal hydroxide;

the resultant slurry of metal hydroxide is kept at a pH of 10 to 13 and oxidized at a temperature of higher than 40ºC and equal to or lower than 60ºC to obtain a precursor slurry;

the resultant precursor slurry is aged at 80 to 150ºC;

an aqueous solution of water-soluble aluminum salt is added to the slurry, and the slurry is kept at a pH of 5 to 9; and

after solid-liquid separation of the slurry, a solid content is subjected to heat treatment at 400 to 700ºC for longer than 1 hour and equal to or shorter than 3 hours.

20. A process for producing the complex black oxide particle recited in claim 10, wherein an aqueous solution of mixed metal salt prepared from water-soluble salts of cobalt, copper, and manganese is mixed and neutralized with alkali hydroxide to obtain a slurry of metal hydroxide;

the resultant slurry of metal hydroxide is kept at a pH of 10 to 13 and oxidized at a temperature of higher than 40ºC and equal to or lower than 60ºC to obtain a precursor slurry;

the resultant precursor slurry is aged at 80 to 150ºC;

an aqueous solution of water-soluble aluminum salt is added to the slurry, followed by adding an aqueous solution of water-soluble phosphorous compound or an aqueous solution of water-soluble silicon compound, and the slurry is kept at a pH of 6 to 10; and

after solid-liquid separation of the slurry, a solid content is subjected to heat treatment at 400 to 700ºC for longer than 1 hour and equal to or shorter than 3 hours.